

a. The Combination of the Cited References Does Not Disclose All of the Elements of Claim 1

To establish a *prima facie* case of obviousness, the prior art combination of references must teach or suggest all the elements of the claims. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A. 1974); *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (C.C.P.A. 1970) (“All words in a claim must be considered in judging the patentability of that claim against the prior art.”). In the absence of such a showing, a *prima facie* case of obviousness is not established. MPEP § 2143.03.

Independent Claim 1 of the instant application recites:

1. A belt comprising (a) a polishing pad for polishing a workpiece in a linear chemical mechanical polishing system and (b) a side opposite the polishing surface, the belt forming an endless loop, an improvement comprising at least one aperture from the polishing surface through the side opposite the polishing surface so that the aperture is substantially free of a window, the aperture positioned on the belt to allow monitoring of the workpiece through the aperture;  
one of a notch along a first edge of the belt and trigger hole, the notch or trigger hole positioned relative to the aperture;  
a monitor positioned to sense the workpiece through the aperture; and  
a sensor positioned such that passing of the trigger hole or notch activates the monitor.

The Office Action states that “Dudovicz et al. discloses an endless belt that may have holes that extend through the belt (from top to bottom)...” The Office Action further states that “Birang discloses an apparatus wherein a hole (30) that ‘is positioned such that it has a view of the wafer’ (Birang, col. 9, lines 32-35), which reads on Applicant’s ‘positioned to allow monitoring of the workpiece.’”

Columns 9-10 of Birang clearly suggest that any aperture for monitoring includes a window. The invention of Birang uses a window to seal off the aperture so that the chemical

slurry applied to the polishing belt does not leak through to the bottom of the platen. (col. 9, ll. 47-50; col. 12, ll. 24-32).

While Dudovicz disclosed a belt that “may have holes,” it does not address the problem of the chemical slurry leaking through to the bottom of the platen. Birang expressly solves this problem by using a window to prevent the slurry from leaking to the platen. (col. 9, ll. 47-50; col. 12, ll. 24-32) Consequently, the combination of Dudovicz with Birang would teach that the holes in the belt disclosed by Dudovicz must include a window to prevent the chemical slurry from leaking through the holes and onto the platen. Hence, the combination of Dudovicz and Birang does not disclose a belt with an aperture “substantially free of a window.”

With respect to the “notch” limitation of Claim 1, the Office Action states that “Engdahl discloses a polishing system that includes a belt, and further comprises a notch or characteristic reference mark (col. 18, lines 18-20), and a monitor and sensor, which sense the workpiece (col. 14, lines 60-67).”

Col. 14, lines 18-20 and 60-67 of Engdahl relate to the positioning of the wafer with respect to a characteristic reference mark, such as a notch, on the wafer. In particular, col. 18, lines 18-20 recite, “[t]he transfer station will align the wafer by rotating the wafer until a characteristic reference mark, for example a notch or flat, is properly aligned.” The notches of Engdahl differ in both structure and function from the notches in Claim 1 of Applicant’s invention. First, the notches of Claim 1 are along a first edge of the belt and not on the wafer itself. This allows the polishing system to be compatible with different wafers, having notches at various locations, without the need to reconfigure the monitoring system for each wafer type. The claimed invention also eliminates the need to mark the wafer with notches, a process which adds expense and may potentially damage the wafer.

Secondly, the notches on the semiconductor wafer as disclosed in Birang are used to align the wafer with respect to the transfer station. The function of the notches on the belt of Applicant's invention serve the function of activating a monitor. The function of aligning a wafer with a transfer station is not the same function as activating a monitor. Consequently, Engdahl does not teach the limitation of using a notch to activate the monitor as recited in Claim 1.

b. The Combination of the Cited References Teach Away From the Present Invention

As further evidence that the combination of references cited by the Examiner does not disclose or suggest all the elements of the present invention, the combination of Dudovicz, Birang, and Engdahl teach away from Applicant's invention because Birang teaches the use of a belt with a window to prevent slurry from leaking to the bottom of the platen, whereas Applicant claims an aperture "substantially free of a window." See In re Sponnoble, 405 F.2d 578, 587 U.S.P.Q. 237 (C.C.P.A. 1969).

2. Dependent Claims 2-7 and 24-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dudovicz et al. (WO99/06182), in view of Birang (EP 0 738 561 A1), in further view of Engdahl et al. This rejection is respectfully traversed.

Claims 2-7 and 24-27 depend from Claim 1, therefore, Applicant respectfully traverses the rejection of dependent Claims 2-7 and 24-27 for the same reasons discussed in accordance with Claim 1 of the present application. Furthermore, since each dependent claim is deemed to define an additional aspect of the invention, the individual reconsideration of the patentability of each dependent claim on its own merits is respectfully requested.

3. Claims 24-38 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dudovicz et al. (WO99/06182), in view of Birang (EP 0 738 561 A1), in further view of Engdahl et al.

a. The Combination of the Cited References Does Not Disclose All of the Elements of Claims 24-38

Claims 28 and 38 have been amended to distinctly and more particularly claim a platen that is able to provide liquid, gas, humidified air or any other equivalent substance to an aperture in the platen, through which a light beam passes. As explained in Applicant's specification at p.11, application of a liquid, gas, humidified air or any other equivalent substance to the platen prevents the chemical slurry that leaks onto the platen from "drying on the platen 25, from drying in the platen orifices where fluid (e.g. air or water) passes through to form the fluid bearing, and prevents scratches or film formation on the platen window."

As the Examiner has noted, Engdahl "discloses platens that can supply air, a liquid or a vacuum to the belt..." (emphasis added) Engdahl does not teach supplying air, liquid or a vacuum to a platen. Engdahl teaches a platen in which "air, or other fluid, emerging from the distribution vents 282 creates a fluid bearing that puts pressure on the belt 178 in a precise, controlled manner while minimizing friction against the belt as it continuously travels over the air bearing." (Engdahl at col. 16, ll. 20-24) The platen disclosed by Engdahl serves as a pressure means on the polishing belt; it does not provide fluid or air to the platen itself in a manner that removes the chemical slurry from the platen and prevents the chemical slurry from drying.

Furthermore, Engdahl does not mention or discuss a belt with an aperture that is substantially free of a window. As a result, Engdahl does not mention or discuss the problem associated with the leakage of chemical slurry onto the platen. There would be no motivation to

modify the platen of Engdahl, so as to provide fluid and air to the platen, in the absence of the problem of slurry leaking through the aperture of the belt onto the platen. Therefore, since the leakage of chemical slurry is not a problem in the invention taught by Engdahl, there is no reason, whatsoever, why Engdahl would suggest to one skilled in the art to direct air or fluid to the platen aperture in order to remove chemical slurry from the platen. Any argument that the platen of Engdahl may be modified to provide air and fluid to the platen itself is purely hindsight and, according to the Federal Circuit, cannot be relied upon to establish obviousness. In re Fritch, 23 U.S.P.Q. 2d 1780, 1783-84 (Fed. Cir. 1992) (holding that it is impermissible to use the claimed invention as an “instruction manual or template” to modify the teachings of the prior art.). For all of the reasons stated above, Engdahl in combination with the cited references does not teach or suggest all the limitations of amended Claims 28 and 38.

Claims 29-37 and newly added Claims 39-40 depend from Claims 28 and 38 respectively, and are allowable for the same reasons discussed in accordance with Claims 28 and 38 of the present application. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Newly added Claim 41 recites that the platen is operable to provide suction to clear a slurry from the platen and is similar to amended Claims 28 and 38. Consequently, it is allowable for the same reasons discussed in accordance with those claims.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

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Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS**

28. (Amended) A belt comprising (a) a polishing surface for polishing a workpiece in a chemical mechanical linear polishing system and (b) a side opposite the polishing surface, the belt forming an endless loop, an improvement comprising at least one aperture from the polishing surface through the side opposite the polishing surface so that the aperture is substantially free of a window, the aperture positioned on the belt to allow monitoring of the workpiece through the aperture; and

a fluid platen adjacent the side opposite, said fluid platen comprising an aperture to allow a light beam to pass through the platen and onto the workpiece, the fluid platen operable to provide liquid and gas pressure to said platen aperture to clear a slurry from said aperture of said platen.

38. (Amended) A belt comprising (a) a polishing surface for polishing a workpiece in a chemical mechanical linear polishing system and (b) a side opposite the polishing surface, the belt forming an endless loop, an improvement comprising at least one aperture from the polishing surface through the side opposite the polishing surface so that the aperture is substantially free of a window, the aperture positioned on the belt to allow monitoring of the workpiece through the aperture; and

a fluid platen adjacent the side opposite, said fluid platen comprising an aperture to allow a light beam to pass through the platen and onto the workpiece, the fluid platen operable to provide humidified air pressure to said platen aperture to clear a slurry from said aperture of said platen.

39. (New) A belt according to Claim 28, wherein said liquid and gas pressure is also directed to said belt aperture to prevent a slurry from draining through said belt aperture onto said platen.

40. (New) A belt according to Claim 38, wherein said humidified air pressure is also directed to said belt aperture to prevent a slurry from draining through said belt aperture onto said platen.

41. (New) A belt comprising (a) a polishing surface for polishing a workpiece in a chemical mechanical linear polishing system and (b) a side opposite the polishing surface, the belt forming an endless loop, an improvement comprising at least one aperture from the polishing surface through the side opposite the polishing surface so that the aperture is substantially free of a window, the aperture positioned on the belt to allow monitoring of the workpiece through the aperture; and a fluid platen adjacent the side opposite, said fluid platen comprising an aperture to allow a light beam to pass from a monitor through the platen and onto the workpiece, said fluid platen operable to provide a suction to said platen aperture to clear a slurry from said aperture of said platen.